

## Section 9: Extraction of Non-Volatile Organic Poisons

### *I. Introduction:*

This procedure allows for the extraction and separation of organic poisons into their acidic, basic, or neutral forms. This procedure uses a direct extraction approach for tablets, capsules, powders, and beer. This extraction procedure can be used to separate aspirin (strong acid, A1 fraction) from codeine (basic, D fraction) as well as extract barbiturates (weak acids, A2 fraction), hallucinogens such as PCP (weak acid, A2 fraction), amphetamines (basic, D fraction), and narcotic analgesics such as oxycodone (basic, D2 fraction).

### *II. Reagents:*

- A.) Ether
- B.) Ammonium hydroxide ( $\text{NH}_4\text{OH}$ )
- C.) Chloroform ( $\text{CHCl}_3$ )

### *III. Equipment:*

- A.) Glass funnel
- B.) Filter paper
- C.) Beaker, sizable to contain filtrate amount
- D.) pH paper
- E.) Glass stir rod

### *IV: Procedure:*

- A.) Direct Extraction (tablets, capsules, powders, beer)
  - 1. Acidify liquid samples and collect filtrate.
  - 2. Extract solids samples first with acidulated water and collect filtrate.
  - 3. Extract filtrate (from step #1 or #2) with ether. There will be two fractions that develop: an Ether "A" fraction (Acid Ether Extract) that contains all ether-soluble acidic and neutral drugs (such as aspirin and barbiturates) and an Aqueous fraction that requires further extraction.
  - 4. Make the Aqueous fraction alkaline with  $\text{NH}_4\text{OH}$ .
  - 5. Extract aqueous fraction with chloroform.
  - 6. Again, two fractions are formed. One fraction is the Chloroform "D" fraction (Basic Chloroform Extract)

that contains all chloroform-soluble basic drugs (such as amphetamines and codeine) and the other fraction is an aqueous fraction that contains water soluble, ether insoluble, and chloroform insoluble drugs.

NOTE: The Acid Ether Extract or "A" Fraction has 3 subgroups:

1. Strong Acid drugs
2. Weak acid or phenolic drugs
3. Neutral drugs

The Basic Chloroform Extract or Chloroform "D" Fraction also has 3 subgroups:

1. Basic drugs with chloroform soluble salts
2. Basic non-amphoteric drugs
3. Amphoteric drugs